(57) Abstract

The invention relates to a process for producing simultaneously food-grade and fodder-grade phosphoric acid by crystallizing phosphoric acid hemihydrate, H_3PO_4 x 0.5 H_2O, from a prepurified feed acid, which is purified and crystallized with the help of the following steps,

a) after the step of froth-flotation of phosphate concentrate, the concentrate is directed to a strongly magnetic separation step in order to decrease the Mg ion amount,

b) the phosphate concentrate is leached in a mixture of sulfuric acid and phosphoric acid according to the wet process, the precipitated SO_4 and As ions are removed, and a silicon source is added in order to adjust the F/Si molar ratio to < 6,

c) the phosphoric acid is concentrated, the solids precipitate is removed, and the F ions are evaporated,

d) the feed acid obtained from step c, having a concentration of > 58% P_2O_5, solids concentration of < 0.05%, Mg ion concentration of < 1.5%, SO_4 ion concentration < 1%, As ion concentration of < 8 ppm and F ion concentration of < 0.2%, is crystallized at a steady crystal growth rate of < 10 µm/min, the temperature difference in the first crystallization being < 17 °C, and the crystals are washed with the undersaturated mother liquor of the subsequent recrystallization step,

e) the phosphoric acid crystallized in step d is melted, is diluted to a concentration of < 63% P_2O_5, seed crystals are added, and crystallization is carried out as in step d, the temperature difference being < 8 °C, and the crystals are washed with an undersaturated solution of phosphoric acid, and

f) optionally the phosphoric acid crystallized in step e is melted, is diluted to a concentration of < 63% P_2O_5, seed crystals are added, and crystallization is carried out as in step d, the temperature difference being < 6 °C, and the crystals are washed with an undersaturated washing solution prepared from product crystals.